

### ABSTRACT OF THE DISCLOSURE

Free-space optical (FSO) laser communication systems offer exceptionally wide-bandwidth, secure connections between platforms that cannot otherwise be connected via physical means such as optical fiber or cable. However, FSO links are subject to strong channel fading due to atmospheric turbulence and beam pointing errors, limiting practical performance and reliability. We have developed a fade-tolerant architecture based on forward error correcting codes (FECs) combined with delayed, redundant, sub-channels. This redundancy is made feasible through dense wavelength division multiplexing (WDM) and/or high-order M-ary modulation. Experiments and simulations show that error-free communications is feasible even when faced with fades that are tens of milliseconds long. We describe plans for practical implementation of a complete system operating at 2.5 Gbps.